

A World Overview-One-hundred-twenty-seven Years of Research on Toxic Cyanobacteria--Where do we go from here?

Carmichael¹, Wayne W.

¹Department of Biological Sciences
Wright State University
Dayton, Ohio 45435 U.S.A.

Email: wayne.carmichael@wright.edu

Key words: CyanoHABs, HABs, Cyanotoxins, Cyanobacteria

Both marine and freshwater Harmful Algae Blooms (HABs) have occurred for hundreds if not thousands of years. The first literature reference for toxic cyanobacteria (CyanoHABs) was in the 1878. George Francis issued a report on sheep and cattle deaths from the brackish water cyanobacteria *Nodularia spumigena* in *Nature* called "Poisonous Australian Lake". For the marine HABs a 1928 report in the *Journal of Preventive Medicine* described human intoxication from mussel poisoning cases in the San Francisco area during July of 1927. This led to work which described the first phycotoxin group, the Saxitoxins, by Edward Schantz in the 1950's ("Paralytic Shellfish Poisons"-isolation and biochemistry of PSPs-later called Saxitoxins). In 1974-the First Int. Conf. Toxic Dinoflagellate Blooms was a response to the 1972 New England Red Tides. The number of international marine HAB conferences is now up to 12. The First Int. Conf. On Toxic Cyanobacteria-proceedings entitled: "The Water Environment Algal Toxins and Health"-was published in 1981. There have now been 6 international conferences on this topic with the 7th to be held in Brazil in 2007. U.S. HAB response resulted in the First Meeting on a U.S. National Plan for Marine Biotoxins and Harmful Algae - 1993. (Ref: Marine Biotoxins and Harmful Algae: A National Plan. Anderson,D.M. et al. WHOI-Jan. 1993. 44 pp.). Legislation in this area led to "The Harmful Algal Bloom Eradication and Control Act of 1998" Subcommittee on Oceans and Fisheries-U.S. Senate. This was followed by the "Harmful Algae Bloom and Hypoxia Research Amendment Act of 2003-Subcommittee on Environment, Technology and Standards-U.S. House of Representatives Committee on Science. This legislation included reference to toxic cyanobacteria. The current national plan is called-**HARRNESS**=Harmful Algal Research and Response; a National Environmental Science Strategy 2005-2015. Citation of this document is as follows: HARRNESS, 2005. Harmful Algal Research and Response: A National Environmental Science Strategy 2005-2015. Ramsdell, J.S., D.M. Anderson and P.M. Gilbert (Eds.), Ecological Society of America, Washington DC, 82 pp. (draft)

This CyanoHAB Overview will focus on: **"What occurrences that have been observed, in freshwater, drinking water, recreational water, estuaries and marine water, and impacts on health and/or ecosystem viability in the U.S. and elsewhere in the world"**.